

# **Biomass: Comparison of Definitions in Legislation**

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## Summary

The use of biomass as an energy feedstock has regularly been presented as a potentially viable alternative to address U.S. energy security concerns, foreign oil dependence, and rural economic development, and as a tool to possibly help improve the environment (e.g., through greenhouse gas emission reduction). Biomass (organic matter that can be converted into energy) may include food crops, crops grown specifically to produce energy (e.g., switchgrass or prairie perennials), crop residues, wood waste and byproducts, and animal manure. Most legislation involving biomass has focused on encouraging the production of liquid fuels from corn. Efforts to promote the use of biomass for power generation have focused on wood, wood residues, and milling waste. Comparatively less emphasis has been placed on the use of non-corn-based biomass feedstocks—other food crops, non-food crops, crop residues, animal manure, and more—as renewable energy sources for liquid fuel use or for power generation. This is partly due to the variety, lack of availability, and dispersed location of non-corn-based biomass feedstock. The technology development status and costs to convert non-corn-based biomass into energy are also viewed by some as obstacles to rapid technology deployment.

To aid in understanding the role of biomass as an energy resource, this report investigates the characterization of biomass in legislation. For over 30 years, the term *biomass* has been a part of legislation enacted by Congress for various programs, indicating some interest by the general public and policy makers in expanding its use. Biomass-related legislation has provided financial incentives to develop technologies that use biomass. How biomass is defined influences decisions about the types of crops that are grown, where they are grown, and potential preferred energy uses, among other things. There have been 14 biomass definitions included in legislation and in the tax code since 2004.

Future discussions about energy—particularly legislation involving the Renewable Fuel Standard, energy tax incentives, or tribal biomass demonstration projects—may prompt further discussion about the definition of biomass. For example, one point of contention regarding the biomass definition and the Renewable Fuel Standard is whether the term should be defined to include biomass from federal lands. Some argue that removal of biomass from these lands may lead to ecological harm. Others contend that biomass from federal lands can aid the production of renewable energy to meet certain mandates (e.g., the Renewable Fuel Standard) and that removal of biomass can enhance forest protection from wildfires.

Bills introduced in the 113<sup>th</sup> Congress (e.g., H.R. 4426, H.R. 4956, H.R. 3084, S. 1267) would have modified the biomass definition. However, little legislative action occurred regarding the definition of biomass in the 113<sup>th</sup> Congress. This report lists biomass definitions enacted by Congress in legislation and the tax code since 2004, and discusses the similarities and differences among the definitions.

## **Contents**

Introduction .....	1
Biomass .....	1
Legislative History .....	1
Analysis of Biomass Definitions .....	2
Potential Issues for Biomass Feedstock Development .....	3
Proposed Modification of the Biomass Definition .....	4

## **Tables**

Table 1. Biomass Definitions Contained in Legislation Enacted Since 2004 .....	5
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## **Contacts**

Author Information.....	12
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## Introduction

The potential for biomass to meet U.S. renewable energy demands has yet to be fully explored. Non-food and other types of biomass (e.g., manure) have traditionally been considered by some as waste material and as such have been deposited in landfills, used for animal feed, or applied to crop production lands. However, high fuel prices, environmental concerns, and sustainability issues have led policy makers to create legislation that would encourage conversion of biomass into liquid fuels (e.g., ethanol, biodiesel), electricity, or thermal energy.<sup>1</sup> Over the last five years, there has been increasing interest in cellulosic biomass (e.g., crop residues, prairie grasses, and woody biomass) because it does not compete directly with crop production for food—although it may compete for land—and because it is located in widely dispersed areas.<sup>2</sup> Classification of biomass as an energy resource has prompted the investigation of its use for purposes additional to liquid fuel (e.g., on-site heating and lighting purposes, off-site electricity).

## Biomass

Biomass is organic matter that can be converted into energy. Common examples of biomass include food crops, crops for energy (e.g., switchgrass or prairie perennials), crop residues (e.g., corn stover), wood waste and byproducts (both mill residues and traditionally noncommercial biomass in the woods), and animal manure. Over the last few years, the concept of biomass has grown to include such diverse sources as algae, construction debris, municipal solid waste, yard waste, and food waste. Some argue that biomass is a renewable resource that is widely available, that may be obtained at minimal cost, and that may produce less greenhouse gas than fossil fuels under certain situations. Others contend that biomass has seen limited use as an energy source thus far because it is not readily available as a year-round feedstock, is often located at dispersed sites, can be expensive to transport, lacks long-term performance data, requires costly technology to convert to energy, and might not meet quality specifications to reliably fuel electric generators.

Woody biomass has received special attention because of its widespread availability, but to date has been of limited use for energy production except for wood wastes at sawmills. Wood can be burned directly, usually to produce both heat or steam and electricity (called combined heat and power, or CHP), or digested to produce liquid fuels. Biomass from forests, as opposed to mill wastes, has been of particular interest, because it is widely accepted that many forests have excess biomass (compared to historical levels) called hazardous fuels that can contribute to catastrophic wildfires.<sup>3</sup> Removing these hazardous fuels from forests could reduce the threat of catastrophic wildfires, at least in some ecosystems, while providing a feedstock for energy production.

## Legislative History

The term *biomass* was first introduced by Congress in the Powerplant and Industrial Fuel Use Act of 1978 (P.L. 95-620) as a type of alternate fuel. However, the term was first defined in the Energy Security Act of 1980 (P.L. 96-294), in Title II, Biomass Energy and Alcohol Fuels, as

<sup>1</sup> For more information on biofuels and biopower, see CRS Report R41282, *Agriculture-Based Biofuels: Overview and Emerging Issues*, and CRS Report R41440, *Biomass Feedstocks for Biopower: Background and Selected Issues*.

<sup>2</sup> The relatively recent interest in cellulosic biomass is also likely due to the expanded Renewable Fuel Standard (RFS), which required that specific volumes of cellulosic biofuel be included in transportation fuel starting in 2010. For more information on the cellulosic biofuel requirement for the RFS, see CRS Report R41106, *The Renewable Fuel Standard (RFS): Cellulosic Biofuels*.

<sup>3</sup> See CRS Report R40811, *Wildfire Fuels and Fuel Reduction*.

“any organic matter which is available on a renewable basis, including agricultural crops and agricultural wastes and residues, wood and wood wastes and residues, animal wastes, municipal wastes, and aquatic plants.” The Energy Security Act of 1980 contained two additional definitions for biomass, excluding aquatic plants and municipal waste, in Title II, Subtitle C, Rural, Agricultural, and Forestry Biomass Energy.

Three pertinent laws contain biomass definitions: the Food, Conservation, and Energy Act of 2008 (2008 farm bill, P.L. 110-246); the Energy Independence and Security Act of 2007 (EISA, P.L. 110-140); and the Energy Policy Act of 2005 (EPA05, P.L. 109-58). The term is mentioned several times throughout the three acts, but is not defined for each provision of the law. In some cases, an individual law has multiple biomass definitions related to various provisions. For example, one definition is included in the 2008 farm bill and three are provided in EISA. EPA05 has six biomass definitions. The tax code contains four additional definitions. In total, 14 biomass definitions have been included in legislation and the tax code since 2004. **Table 1** includes definitions from the three laws and from the tax code, and contains additional comments.

The definitions are built into the many provisions and programs that may support research and development, encourage technology transfer, and reduce technology costs for landowners and businesses. Thus, because the various definitions determine which feedstocks can be used under the various programs, the definitions are critical to the research, development, and application of biomass used to produce energy.

## Analysis of Biomass Definitions

Of the many biomass definitions, two may be considered by policy makers, scientists, and program managers as the most comprehensive for energy production purposes: the definition in Title IX of the 2008 farm bill and the definition in Title II of EISA. Both laws provide an extensive definition for renewable biomass, but each law defines renewable biomass somewhat differently. The recognition of biomass as renewable means that biomass is considered by some to be an infinite feedstock that may be replenished in a short time frame. Both definitions consider crops, crop residues, plants, algae, animal waste, food waste, and yard waste, among other items, as appropriate biomass feedstock.

Whether the biomass is grown on federal lands is an important distinction between the two definitions for renewable biomass. The 2008 farm bill includes biomass from federal lands as a biofuel feedstock. In contrast, to be eligible for the Renewable Fuel Standard (RFS) under EISA, biomass cannot be removed from federal lands, and the law excludes crops from forested lands.<sup>4</sup> In the 113<sup>th</sup> Congress, there was some congressional discussion and legislation to expand the EISA definition to include biomass from federal lands to better meet the RFS biofuels usage mandate.<sup>5</sup> None of the legislation was enacted.

EISA expanded the RFS and restricted the definition of biomass. As described above, the renewable biomass definition for the RFS under EISA excludes biomass removed from federal lands and crops from forested lands as biofuel feedstocks. Advocates for this definition include groups who favor minimal land disturbance (for ecological reasons as well as to sustain

<sup>4</sup> The Renewable Fuel Standard (RFS) is a provision established by the Energy Policy Act of 2005 requiring gasoline to contain a minimum amount of fuel produced from renewable biomass. For more information on the RFS, see CRS Report R40155, *Renewable Fuel Standard (RFS): Overview and Issues*.

<sup>5</sup> For example, H.R. 4956 (113<sup>th</sup> Congress) would have removed the non-federal land requirement from the renewable biomass definition applicable for the Renewable Fuel Standard. This would have allowed biofuel produced from biomass from forestlands on public lands to qualify for the mandate.

sequestered carbon) and are concerned that incentives to use wood waste might increase land disturbance, especially timber harvesting on federal lands. Opponents of this definition include groups who seek to use materials from federal lands and other forested lands (i.e., not tree plantations) as a source of renewable energy while possibly contributing to long-term, sustainable management of those lands.

Advocates of the renewable biomass definition in the 2008 farm bill include groups who seek to use the potentially substantial volumes of waste woody biomass from federal lands and other (non-plantation) forest lands (e.g., waste from timber harvests, from pre-commercial thinnings, or from wildfire fuel reduction treatments) as a source of renewable energy. Opponents include groups who seek to preserve forested land and federal land, and who are concerned that incentives for using wood waste would encourage activities that could disturb forest lands, possibly damaging important wildlife habitats and water quality, as well as releasing carbon from forest soils.

## Potential Issues for Biomass Feedstock Development

It is not clear whether the biomass definitions in the 2008 farm bill and in EISA constitute a barrier to biomass feedstock development for conversion to liquid fuels. Concerns for some landowners and business entities that wish to enter the biomass feedstock market include economic stability, risk/reward ratio, revenue generation, land use designation, and lifecycle greenhouse gas emissions. Additionally, the feedstock development potential of woody biomass varies by region. For example, biomass stock tends to be located on private forest land in the southeastern United States and on federal land in the western United States. Different regions may require different resources to develop a robust biomass feedstock market.

There is mixed support for biomass use, including its feedstock development. Recent agricultural and energy legislation has incorporated provisions and established programs to promote the development and use of biomass as a renewable energy source.<sup>6</sup> For example, in the 113<sup>th</sup> Congress, the House passed H.R. 2, which would have allowed Indian tribes, from FY2014-FY2018, to carry out demonstration projects to promote biomass energy production on Indian forest land and in nearby communities by providing tribes with reliable supplies of woody biomass from federal lands. However, there also have been efforts in Congress to stall or prevent the use of biomass for energy production, which in turn would impact biomass feedstock development. For instance, there were repeated attempts to eliminate certain portions of the Renewable Fuel Standard (H.R. 4849; 113<sup>th</sup> Congress). Further, the House initially passed an FY2015 National Defense Authorization Act (H.R. 3979; 113<sup>th</sup> Congress) that would have prohibited the Department of Defense (DOD) from large-scale purchases of biofuels unless they are cost-competitive, and would have also required DOD to provide a business case analysis to Congress before constructing a biofuel refinery. The provisions were significantly modified in a later version of the bill that passed both chambers and was signed into law (P.L. 113-291).<sup>7</sup>

The success of the provisions and programs that support biomass as a renewable feedstock will be partly determined by landowner participation rates. Participation rates may depend on the

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<sup>6</sup> For more information, see CRS Report R43416, *Energy Provisions in the 2014 Farm Bill (P.L. 113-79)*, and CRS Report R40913, *Renewable Energy and Energy Efficiency Incentives: A Summary of Federal Programs*.

<sup>7</sup> There is a provision in the law that requires that DOD notify Congress at least 30 days prior to the department entering any contract to plan, design, refurbish or construct a biofuel refinery.

definition provided in the legislation that authorizes financial and technical support. Landowners are eligible to receive financial or technical assistance for biomass feedstock development based on the renewable biomass definition for a specific program. One program that may have the potential to increase the level of private landowner participation in the biomass feedstock market is the Biomass Crop Assistance Program (BCAP), established in Section 9011 of the 2008 farm bill.<sup>8</sup> BCAP, administered by the USDA Farm Service Agency, is intended to support the establishment and production of eligible crops for conversion to bioenergy.<sup>9</sup>

## Proposed Modification of the Biomass Definition

The definition for biomass contained in legislation determines what sources of material are deemed eligible as biomass and which lands are eligible for biomass removal for inclusion in the RFS and for treatment in the tax code. The biomass definition in legislation influences decisions on the types of crops grown, where they are grown, and their potential preferred energy uses, among other things. Biomass definitions typically contain three components: agriculture (e.g., crops), forestry (e.g., slash, pre-commercial thinnings), and waste (e.g., food, yard). Multiple biomass definitions can be included in a single piece of legislation to meet the requirements of associated programs or provisions. Environmental groups, private entities aspiring to participate in biomass-to-energy initiatives, and federal agencies that administer biomass-to-energy programs are likely to closely monitor biomass definitions proposed during future farm bill and energy debates in Congress.

Biomass debate and action in the 113<sup>th</sup> Congress was minimal, although bills were introduced to modify its definition (H.R. 4426, H.R. 4956, H.R. 3084, S. 1267). Further, debates about the definition of biomass were not as extensive in the 113<sup>th</sup> Congress as they were in previous Congresses (e.g., 111<sup>th</sup> Congress).<sup>10</sup> Forthcoming congressional consideration of energy issues, particularly legislation involving the Renewable Fuel Standard or energy tax incentives, may prompt further discussion about the biomass definition in the 114<sup>th</sup> Congress.

<sup>8</sup> For more information on BCAP, see CRS Report R41296, *Biomass Crop Assistance Program (BCAP): Status and Issues*.

<sup>9</sup> Crops or lands that receive payments under Title I of the 2008 farm bill are not eligible for participation in BCAP. Title 1 of the farm bill covers farm commodity support and dairy support, among other items.

<sup>10</sup> There was also minimal debate about biomass definitions in the 112<sup>th</sup> Congress. Bills introduced during the 112<sup>th</sup> Congress to modify the biomass definition included S. 559, S. 781, H.R. 1861, and H.R. 1920. Significant attention was focused on the proposed biomass definitions contained in multiple legislative proposals put forth by the 111<sup>th</sup> Congress, including the American Clean Energy and Security Act of 2009 (ACES; H.R. 2454), the American Clean Energy Leadership Act of 2009 (ACELA; S. 1462), the Clean Energy Jobs and American Power Act (S. 1733), and the American Power Act (discussion draft). Discussion regarding the definition of biomass during the 111<sup>th</sup> Congress tended to center on the type of forestry products considered as an eligible biomass source and the lands (e.g., federal, forested) where biomass removal can occur. The eligibility of forest products may have been a contentious aspect of the biomass definition primarily because of differing viewpoints on the sustainability of woody biomass supplies. Some voice disapproval about forest lands being eligible for biomass removal generally because it is uncertain whether forestry products can be removed and transported to an energy conversion facility with minimal environmental impact, and whether such removals damage forest health. Others contend that inclusion of biomass removal from federal and forested lands is necessary to meet specific biofuel mandates established in the RFS.



Table I. Biomass Definitions Contained in Legislation Enacted Since 2004

No. <sup>a</sup>	Public Law/ Tax Code	Definition	Comments
I	P.L. 110-246 Food, Conservation, and Energy Act of 2008 Title IX Section 9001(12)	<p>The term <b>renewable biomass</b> means—</p> <p>‘(A) materials, pre-commercial thinnings, or invasive species from National Forest System land and public lands (as defined in section 103 of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1702)) that—‘(i) are byproducts of preventive treatments that are removed—‘(I) to reduce hazardous fuels; ‘(II) to reduce or contain disease or insect infestation; or ‘(III) to restore ecosystem health; ‘(ii) would not otherwise be used for higher-value products; and ‘(iii) are harvested in accordance with—‘(I) applicable law and land management plans; and ‘(II) the requirements for—‘(aa) old-growth maintenance, restoration, and management direction of paragraphs (2), (3), and (4) of subsection (e) of section 102 of the Healthy Forests Restoration Act of 2003 (16 U.S.C. 6512); and ‘(bb) large-tree retention of subsection (f) of that section; or</p> <p>‘(B) any organic matter that is available on a renewable or recurring basis from non-Federal land or land belonging to an Indian or Indian tribe that is held in trust by the United States or subject to a restriction against alienation imposed by the United States, including—‘(i) renewable plant material, including—‘(I) feed grains; ‘(II) other agricultural commodities; ‘(III) other plants and trees; and ‘(IV) algae; and ‘(ii) waste material, including—‘(I) crop residue; ‘(II) other vegetative waste material (including wood waste and wood residues); ‘(III) animal waste and byproducts (including fats, oils, greases, and manure); and ‘(IV) food waste and yard waste.</p>	<p>Definition associated with the following sections in the bill: Biorefinery Assistance Program (§9003), Repowering Assistance (§9004), Biomass Research and Development Initiative (§9008), Biomass Crop Assistance Program (§9011), Forest Biomass for Energy (§9012), and Community Wood Energy Program (§9013).</p> <p>In contrast to the RFS definition of <i>renewable biomass</i> (EISA, Title II, §201(1)(I)), this definition allows biomass from federal lands as a biofuel feedstock.</p> <p>The definition <i>includes</i> materials, pre-commercial thinnings, or invasive species from National Forest System land and public (BLM) lands; organic matter available on a renewable or recurring basis from non-federal or Indian land; renewable plant material (e.g., feed grains, other agricultural commodities, other plants and trees, and algae) and waste material (e.g., crop residue and other vegetative waste material, such as wood waste and wood residues), as well as animal waste and byproducts (including fats, oils, greases, and manure), food waste, and yard waste.</p> <p>This definition does <i>not</i> mention biomass from wildfire fuel treatments in the immediate vicinity of buildings, as does the RFS <i>renewable biomass</i> definition. (See definition 2.)</p> <p>No limits on private-sector participation evident.</p>



No. <sup>a</sup>	Public Law/ Tax Code	Definition	Comments
2	P.L. 110-140 Energy Independence and Security Act of 2007 Title II Section 201(1)(I)	<p>The term <b>renewable biomass</b> means each of the following:</p> <p>“(i) Planted crops and crop residue harvested from agricultural land cleared or cultivated at any time prior to the enactment of this sentence that is either actively managed or fallow, and nonforested.</p> <p>“(ii) Planted trees and tree residue from actively managed tree plantations on non-federal land cleared at any time prior to enactment of this sentence, including land belonging to an Indian tribe or an Indian individual, that is held in trust by the United States or subject to a restriction against alienation imposed by the United States.</p> <p>“(iii) Animal waste material and animal byproducts.</p> <p>“(iv) Slash and pre-commercial thinnings that are from non-federal forestlands, including forestlands belonging to an Indian tribe or an Indian individual, that are held in trust by the United States or subject to a restriction against alienation imposed by the United States, but not forests or forestlands that are ecological communities with a global or State ranking of critically imperiled, imperiled, or rare pursuant to a State Natural Heritage Program, old growth forest, or late successional forest.</p> <p>“(v) Biomass obtained from the immediate vicinity of buildings and other areas regularly occupied by people, or of public infrastructure, at risk from wildfire.</p> <p>“(vi) Algae.</p> <p>“(vii) Separated yard waste or food waste, including recycled cooking and trap grease.</p>	<p>Definition associated with this section in the bill: Renewable Fuel Standard (Title II, Subtitle A).</p> <p>This provision defines renewable biomass for the Renewable Fuel Standard (Title II, Subtitle A). The definition <i>excludes</i>, as biofuel feedstocks, biomass removed from federal lands and crops for forested lands (e.g., timber harvests). The definition <i>includes</i> biomass from:</p> <ul style="list-style-type: none"> <li>• slash and pre-commercial thinnings from non-federal forestlands, including Indian forestlands, but not from forestlands that are ecological communities within a global or state ranking of critically imperiled, imperiled, or rare pursuant to a State Natural Heritage Program, and not from old-growth or late successional forests;</li> <li>• planted trees and tree residue from actively managed tree plantations on non-federal land;</li> <li>• biomass obtained from the immediate vicinity of buildings, public infrastructure, and areas regularly occupied by people that are at risk from wildfire (e.g., from wildfire fuel reduction activities on non-federal lands); and</li> <li>• other activities, including planted crops and crop residue from nonforested agricultural land that is either actively managed or fallow; animal waste material and byproducts; separated yard waste or food waste (including recycled cooking and trap grease); and algae.</li> </ul> <p>Some biomass material may come from non-federal forest lands.</p>

No. <sup>a</sup>	Public Law/ Tax Code	Definition	Comments
3	P.L. 110-140 Energy Independence and Security Act of 2007 Title XII Section 1201	The term <b>biomass</b> —‘(aa) means any organic material that is available on a renewable or recurring basis, including—‘(AA) agricultural crops; ‘(BB) trees grown for energy production; ‘(CC) wood waste and wood residues; ‘(DD) plants (including aquatic plants and grasses); ‘(EE) residues; ‘(FF) fibers; ‘(GG) animal wastes and other waste materials; and ‘(HH) fats, oils, and greases (including recycled fats, oils, and greases); and ‘(bb) does not include—‘(AA) paper that is commonly recycled; or ‘(BB) unsegregated solid waste.	<p>Definition associated with this section in the bill: Express Loans for Renewable Energy and Energy Efficiency (§1201).</p> <p>The definition <i>excludes</i> paper that is commonly recycled and unsegregated solid waste.</p> <p>The definition <i>includes</i> any organic material available on a renewable or recurring basis, including agricultural crops, trees grown for energy production, wood waste and wood residues, plants (including aquatic plants and grasses), residues, fibers, animal wastes and other waste materials, and fats, oils, and greases (including recycled fats, oils, and greases).</p> <p>The definition is much less restrictive than the <i>renewable biomass</i> definition listed under EISA, Title II, Section 201(1)(I) for the RFS.</p> <p>The definition is similar to the biomass definition under the EPA05 Renewable Energy Security Provision (§206).</p> <p>Does not specify “actively managed” crops and trees as a criterion as mentioned in definition 2.</p>
4	P.L. 110-140 Energy Independence and Security Act of 2007 Title XII Section 1203(e)(z)(4)(A)	The term <b>biomass</b> —‘(i) means any organic material that is available on a renewable or recurring basis, including—‘(I) agricultural crops; ‘(II) trees grown for energy production; ‘(III) wood waste and wood residues; ‘(IV) plants (including aquatic plants and grasses); ‘(V) residues; ‘(VI) fibers; ‘(VII) animal wastes and other waste materials; and ‘(VIII) fats, oils, and greases (including recycled fats, oils, and greases); and ‘(ii) does not include—‘(I) paper that is commonly recycled; or ‘(II) unsegregated solid waste.	<p>Definition associated with this section in the bill: Small Business Energy Efficiency Program (§1203).</p> <p>Applicable biomass is identical to materials described in definition 3.</p>
5	Tax Code 2007 Title 26 Subtitle A Chapter I Subchapter A Part IV Subpart D Section 45(c)(2)	The term <b>closed-loop biomass</b> means any organic material from a plant which is planted exclusively for purposes of being used at a qualified facility to produce electricity.	<p>Definition associated with this section in the code: Electricity Produced from Certain Renewable Resources (§45).</p> <p>Definition associated with this tax credit: Renewable Electricity, Refined Coal, and Indian Coal Production Credit (IRS Form 8835).</p> <p>Denotes the following as applicable biomass:</p> <ul style="list-style-type: none"> <li>any organic material from a plant that is grown exclusively to produce electricity.</li> </ul>

No. <sup>a</sup>	Public Law/ Tax Code	Definition	Comments
6	Tax Code 2007 Title 26 Subtitle A Chapter I Subchapter A Part IV Subpart D Section 45(c)(3)	The term <b>open-loop biomass</b> means— (i) any agricultural livestock waste nutrients, or (ii) any solid, nonhazardous, cellulosic waste material or any lignin material which is segregated from other waste materials and which is derived from—(I) any of the following forest-related resources: mill and harvesting residues, precommercial thinnings, slash, and brush, (II) solid wood waste materials, including waste pallets, crates, dunnage, manufacturing and construction wood wastes (other than pressure-treated, chemically-treated, or painted wood wastes), and landscape or right-of-way tree trimmings, but not including municipal solid waste, gas derived from the biodegradation of solid waste, or paper which is commonly recycled, or (III) agriculture sources, including orchard tree crops, vineyard, grain, legumes, sugar, and other crop by-products or residues. Such term shall not include closed-loop biomass or biomass burned in conjunction with fossil fuel (cofiring) beyond such fossil fuel required for startup and flame stabilization.	Definition associated with this section in the code: Electricity Produced from Certain Renewable Resources (§45). Definition associated with this tax credit: Renewable Electricity, Refined Coal, and Indian Coal Production Credit (IRS Form 8835). Denotes the following as applicable biomass: <ul style="list-style-type: none"> <li>any agricultural livestock waste nutrients.</li> <li>any solid, nonhazardous, cellulosic waste material or lignin material.</li> </ul> Does not include municipal solid waste, gas derived from the biodegradation of solid waste, or paper which is commonly recycled. Does not include closed-loop biomass or biomass burned in conjunction with fossil fuel (cofiring) beyond such fossil fuel required for startup and flame stabilization.
7	Tax Code 2007 Title 26 Subtitle A Chapter I Subchapter A Part IV Subpart D Section 45k(c)(3)	The term <b>biomass</b> means any organic material other than—(A) oil and natural gas (or any product thereof), and (B) coal (including lignite) or any product thereof.	Definition associated with this section in the code: Tax Credit for Producing Fuel from a Nonconventional Source (§45k). Denotes the following as applicable biomass: <ul style="list-style-type: none"> <li>any organic material other than oil and natural gas, and coal or any product thereof.</li> </ul> Definition does not distinguish between open-loop biomass and closed-loop biomass. Definition appears to be more expansive than definitions provided in P.L. 110-140 and P.L. 110-246.

No. <sup>a</sup>	Public Law/ Tax Code	Definition	Comments
8	Tax Code 2007 Title 26 Subtitle A Chapter I Subchapter A Part IV Subpart E Section 48b(c)(4)	The term <b>biomass</b> means any—(i) agricultural or plant waste, (ii) byproduct of wood or paper mill operations, including lignin in spent pulping liquors, and (iii) other products of forestry maintenance. (B) Exclusion: The term “biomass” does not include paper which is commonly recycled.	Definition associated with this section in the code: Qualifying Gasification Project Credit (§48b). Denotes the following as applicable biomass: <ul style="list-style-type: none"> <li>any agricultural or plant waste.</li> <li>wood or paper mill operations byproduct.</li> <li>other products of forestry maintenance.</li> </ul> Does not include paper which is commonly recycled. Does not include closed-loop biomass.
9	P.L. 109-58 Energy Policy Act of 2005 Title II Section 203(b)(1)	The term <b>biomass</b> means any lignin waste material that is segregated from other waste materials and is determined to be nonhazardous by the Administrator of the Environmental Protection Agency and any solid, nonhazardous, cellulosic material that is derived from—(A) any of the following forest-related resources: mill residues, precommercial thinnings, slash, and brush, or nonmerchantable material; (B) solid wood waste materials, including waste pallets, crates, dunnage, manufacturing and construction wood wastes (other than pressure-treated, chemically treated, or painted wood wastes), and landscape or right-of-way tree trimmings, but not including municipal solid waste (garbage), gas derived from the biodegradation of solid waste, or paper that is commonly recycled; (C) agriculture wastes, including orchard tree crops, vineyard, grain, legumes, sugar, and other crop by-products or residues, and livestock waste nutrients; or (D) a plant that is grown exclusively as a fuel for the production of electricity.	Definition associated with this section in the bill: Federal Government Purchase Requirement for Renewable Energy (§203). Denotes the following as applicable biomass: <ul style="list-style-type: none"> <li>any lignin waste material that is segregated from other waste materials.</li> <li>any solid, nonhazardous, cellulosic material derived from forest-related resources, solid wood waste materials, agriculture wastes, or a plant that is grown exclusively as a fuel for the production of electricity.</li> </ul> Does not include municipal solid waste, gas derived from the biodegradation of solid waste, or paper that is commonly recycled. Introduces a concept that will be defined in 2007 as “closed-loop biomass” in the Internal Revenue Code. Does not specify “actively managed” crops and trees as a criterion as mentioned in definition 2. Does not discuss biomass obtained from the immediate vicinity of buildings (see definition 2). Limits on private-sector participation not specified.

No. <sup>a</sup>	Public Law/ Tax Code	Definition	Comments
10	P.L. 109-58 Energy Policy Act of 2005 Title II Section 206(a)(6)(B)	The term <b>biomass</b> means any organic matter that is available on a renewable or recurring basis, including agricultural crops and trees, wood and wood wastes and residues, plants (including aquatic plants), grasses, residues, fibers, and animal wastes, municipal wastes, and other waste materials.	<p>Definition associated with this section in the bill: Renewable Energy Security Provision (§206).</p> <p>Denotes the following as applicable biomass:</p> <ul style="list-style-type: none"> <li>any organic matter available on a renewable or recurring basis including agricultural crops and trees, wood and wood wastes and residues, plants (including aquatic plants), grasses, residues, fibers, and animal wastes, municipal wastes, and other waste materials.</li> </ul> <p>Limits on private-sector participation not specified.</p>
11	P.L. 109-58 Energy Policy Act of 2005 Title II Section 210(a)(1)	The term <b>biomass</b> means nonmerchantable materials or precommercial thinnings that are byproducts of preventive treatments, such as trees, wood, brush, thinnings, chips, and slash, that are removed—(A) to reduce hazardous fuels; (B) to reduce or contain disease or insect infestation; or (C) to restore forest health.	<p>Definition associated with this section in the bill: Grants to Improve Commercial Value of Forest Biomass for Electric Energy, Useful Heat, Transportation Fuels and Other Commercial Purposes Program (§210).</p> <p>Denotes the following as applicable biomass:</p> <ul style="list-style-type: none"> <li>unmarketable materials or precommercial thinnings that are byproducts of preventive treatments, such as trees, wood, brush, thinnings, chips, and slash.</li> </ul> <p>Definition limited to forestry biomass sources.</p> <p>Limits on private-sector participation not specified.</p>

No. <sup>a</sup>	Public Law/ Tax Code	Definition	Comments
12	P.L. 109-58 Energy Policy Act of 2005  Title IX Subtitle C  Section 932(a)(1)	The term <b>biomass</b> means—(A) any organic material grown for the purpose of being converted to energy; (B) any organic byproduct of agriculture (including wastes from food production and processing) that can be converted into energy; or (C) any waste material that can be converted to energy, is segregated from other waste materials, and is derived from—(i) any of the following forest-related resources: mill residues, precommercial thinnings, slash, brush, or otherwise nonmerchantable material; or (ii) wood waste materials, including waste pallets, crates, dunnage, manufacturing and construction wood wastes (other than pressure-treated, chemically-treated, or painted wood wastes), and landscape or right-of-way tree trimmings, but not including municipal solid waste, gas derived from the biodegradation of municipal solid waste, or paper that is commonly recycled.	<p>Definition associated with this section in the bill: Bioenergy Program (§932).</p> <p>Denotes the following as applicable biomass:</p> <ul style="list-style-type: none"> <li>any organic material grown for the purpose of being converted to energy.</li> <li>any organic byproduct of agriculture.</li> <li>any waste material that can be converted to energy, is segregated from other waste materials, and is derived from forest-related resources or wood waste materials, and landscape or right-of-way tree trimmings.</li> </ul> <p>Does not include municipal solid waste, gas derived from the biodegradation of municipal solid waste, or paper that is commonly recycled.</p> <p>Does not specify “actively managed” crops and trees as a criterion as mentioned in definition 2.</p> <p>Limits on private-sector participation not specified.</p>
13	P.L. 109-58 Energy Policy Act of 2005  Title XIII Subtitle A  Section 1307  Section 48B(c)(4)	The term <b>biomass</b> means any—‘(i) agricultural or plant waste, ‘(ii) byproduct of wood or paper mill operations, including lignin in spent pulping liquors, and ‘(iii) other products of forestry maintenance. ‘(B) EXCLUSION- The term ‘biomass’ does not include paper which is commonly recycled.	<p>Definition associated with this section in the bill: Credit for Investment in Clean Coal Facilities (§1307).</p> <p>Denotes the following as applicable biomass:</p> <ul style="list-style-type: none"> <li>any agricultural or plant waste.</li> <li>any byproduct of wood or paper mill operations.</li> <li>any other products of forestry maintenance.</li> </ul> <p>Does not include paper which is commonly recycled.</p> <p>Does not specify “actively managed” crops and trees as a criterion as mentioned in definition 2.</p> <p>Limits on private-sector participation not specified.</p>

No. <sup>a</sup>	Public Law/ Tax Code	Definition	Comments
14	P.L. 109-58 Energy Policy Act of 2005 Title XV Subtitle A Section 1512(r)(4)(B)	The term <b>renewable biomass</b> is, as defined in Presidential Executive Order 13134, published in the <i>Federal Register</i> on August 16, 1999, any organic matter that is available on a renewable or recurring basis (excluding old-growth timber), including dedicated energy crops and trees, agricultural food and feed crop residues, aquatic plants, animal wastes, wood and wood residues, paper and paper residues, and other vegetative waste materials. Old-growth timber means timber of a forest from the late successional stage of forest development.	Definition associated with this section in the bill: Conversion Assistance for Cellulosic Biomass, Waste-Derived Ethanol, Approved Renewable Fuels Grants Program (§1512). Denotes the following as applicable biomass: <ul style="list-style-type: none"> <li>any organic matter that is available on a renewable or recurring basis (excluding old-growth timber) including dedicated energy crops and trees, agricultural food and feed crop residues, aquatic plants, animal wastes, wood and wood residues, paper and paper residues, and other vegetative waste materials.</li> </ul> Does not specify “actively managed” crops and trees as a criterion as mentioned in definition 2. Limits on private-sector participation not specified.

a. Numerical listing of definitions does not reflect any order of importance.

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